STANDARD FORM NO. 64

Stillwater
Reports

Office Memorandum • UNITED STATES GOVERNMENT

TO : Refuge Manager, Stillwater Wildlife Management Area, Fallon, Nevada

DATE: November 19, 1951

FROM : Regional Refuge Supervisor, Portland, Oregon

SUBJECT: Narrative Report - May-August 1951 (1-R)

We wish to compliment you and others of the staff who had a part in the preparation of the Stillwater May-August 1951 Narrative Report. It is outstanding in recording the accomplishments made during the period and will play a most important part in future years as a source of reference material.

The narrative section, in addition to being well written, gives excellent coverage to the subjects with which we are concerned at this particular time, particularly the wildlife use, the effect of the development on such use to date and the account of the construction program. Too, the photographic section is very good and illustrates most clearly the type and scope of the operations and the problems that are confronting you in carrying this through to completion.

Our thanks for a good job,

Kenneth F. MacDonald

Kenneth F. MacDonald

FRONTISPIECE

Harvesting Alkali Bulrush Seed

NARRATIVE REPORT

STILLWATER WILDLIFE MANAGEMENT AREA

MAY - AUGUST
1951

PERSONNEL

LeRoy W. Giles	Refuge Manager, Acting
David B. Marshall	Refuge Manager
Illa E. Cress	Clerk (Typing)
Earl W. Nygren	Maintenance Supervisor
Arthur V. Huff	Mechanic, General

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I GENERAL

A. Weather Conditions

As far as weather is concerned, it has been a quiet, normal, summer. There has been less wind than usual and evaporation has dropped accordingly, but rainfall and temperature has been about average.

The amount of precipitation was actually somewhat greater than that recorded. On August 21st a heavy rain squall passed over the refuge resulting in at least on inch of precipitation. On this date only a small amount of rainfall was recorded for Fallon where the weather station is located. All construction work in the marsh was suspended for three days as a result of this rain.

Month	Precip.	Miles of Wind	Max. Temp.	Min. Temp.	Mean	Evap.
May	0.71	2383.0	91	26	57.6	6.41
June	0.07	1478.8	92	34	66.1	6.62
July	0.02	1270.1	99	41	72.9	7.66
August	0.52	1326.8	97	38	69.5	7.05
Totals	1.32	6458.7	99	26	66.5	27.74
40 year Average	1.26	9060.7	99.8	29.2	66.7	31.95

B. Water Conditions

As usual we are concerned by higher than needed water levels in the marsh. The District Watermaster has informed us that we should be receiving a heavy inflow because the hot, dry, weather has resulted in unusually heavy demands for irrigation water. Actually, our inflow has not been a great deal more than last year. The total discharge from Stillwater Point Reservoir for the past four months was 23,192 acre feet while the discharge for the same period last year was 22,505 acre feet.

Most of our water troubles stem from the fact that we are attempting to confine practically all of our water to the west part of the marsh, yet lack facilities for controlling water in this area. All of the flow from Stillwater Point Reservoir is being diverted through the 4-Way Structure No. 5 to the marsh west of the Swan Lake Dike. This same area receives, in addition, all of the flow through the Canvasback Gun Club.

As a consequence of this confinement water levels have raised until they are now at approximately the same height that they were

during the flood last winter.

Fortunately, the marsh is not entirely bounded by high banks so that the water has spread over many acres of adjacent low lying area. These marginal overflow lands have acted as safety valves and have absorbed enough of the surplus water to prevent the overall depth from becoming excessive.

By withholding water from the east portion of the marsh, we have been able to dry this area sufficiently to permit the successful operation of heavy equipment. A large part of the additional work required on Pintail Bay Dike has been completed by the elevating grader. Furthermore, the Nutgrass Unit is drying so rapidly that it should be possible, within the next 30 days, to start the elevating grader on the construction of the Nutgrass Dike.

It has been possible to withhold some water from the marsh. The amount that we have been able to dispose of is small but so far has been sufficient to prevent spillage through the 4-Way Structure No. 5 into the Nutgrass Unit. Water is being dumped via the East Canal into the East Alkali Flat; a small quantity has been diverted to Unit 1 of the West Waterfowl Food Plot; and we are starting to fill Dry Lake (Pool 3889) from the West Canal. By utilizing these means of dispersal we have been able to cut approximately 40 cfs from the 110 cfs being discharged from Stillwater Point Reservoir.

C. Fires.

No fires occurred during the period.

II WILDLIFE

A. Migratory Birds

1. Population and Behavior

Before we get down to facts and figures, it seems important to include a discussion of how we arrived at the production estimates and population figures to follow, as such figures are only as good as the techniques employed.

Our weekly waterfowl censuses were made, for the most part, as in the past, that is, by utilizing both airplane and ground counts. However, it was not always possible to make these counts on a weekly basis and still obtain reliable data. The airplane comes in about once a month. At this time a complete count of the area is always possible. From the ground a sample count is made which, at best, takes 50 to 75% of the waterfowl population. Attempts to make this ground count proved futile at times because the marsh was found all but vacated except for the Big Water. Here practically our total

waterfowl population would be found including hens with broods along with thousands of shorebirds and other waterbirds. Obviously, it was impossible to stand on the shore of the almost three mile wide Big Water and separate adult ducks, coots and geese from all the others, especially when they tend to congregate in the center of this water body, a mile or more from the observer. When this situation occurs, we can only wait for Ross Hanson with his airplane. A sample count of the Big Water would also be impractical because the size of this lake varies, winds change its location when it becomes low and the waterfowl concentration points on it vary.

Leaving our population, we have the matter of determining our production. Here we have wandered from the standard practice of production determination by brood counts. Although this method would be very adaptable to the Indian Lakes, the reverse is true for the Stillwater Marsh where for the following reasons it is not possible to count enough broods through use of sample areas or otherwise to use as a basis for determining productivity:

1. In marsh areas broods stay nearby heavy cover, which they dash into upon being approached often before they can be identified and counted. It is felt many reach cover before we ever see them.

2. At Class II stage, or before, there is a heavy movement of broods that would take them in and out of any sample area set up.

3. Large portions of the marsh go dry, thereby forcing broods to go elsewhere, including into any sample areas set up.

4. Sample brood count areas set up would not be applicable to the future because of development plan changes.

5. This year broods in the latter part of Class II and Class III stages wound up on the Big Water where they banded up and stayed considerable distance from land. For the above reasons, our brood counts served only as a contribution to the data being gathered by the Central Office.

Most of our data are based on a territorial or nesting pair count such as was made last year. This count is based on the fact a pair of ducks, after having arrived on their breeding grounds and mated, establish, defend, rest and feed on a territory. Our system is to cover the area by checking our ponds and walking or driving the shorelines. Each territorial pair is located on a field map. The data are later transferred to a mounted cover map by use of map tacks, a tack of a particular color representing a territorial pair of a particular species. In addition to pairs, lone males on loafing bars are included. Early nesters are missed, but in case their broods are seen, these early Class I's are taken to indicate the approximate location of of what was their parent's territory. No difficulty has been experienced in differentiating migrants from territorial pairs because the former are flocked up and fly off to

another part of the marsh when flushed. Obviously, we miss a portion of the territorial pairs by incomplete coverage as well as those cases where the hen is at the incubation stage, the drake having thus abandoned her. To account for this we boosted our count by as much as 50 or 75% for some areas, depending upon the species and completeness of coverage.

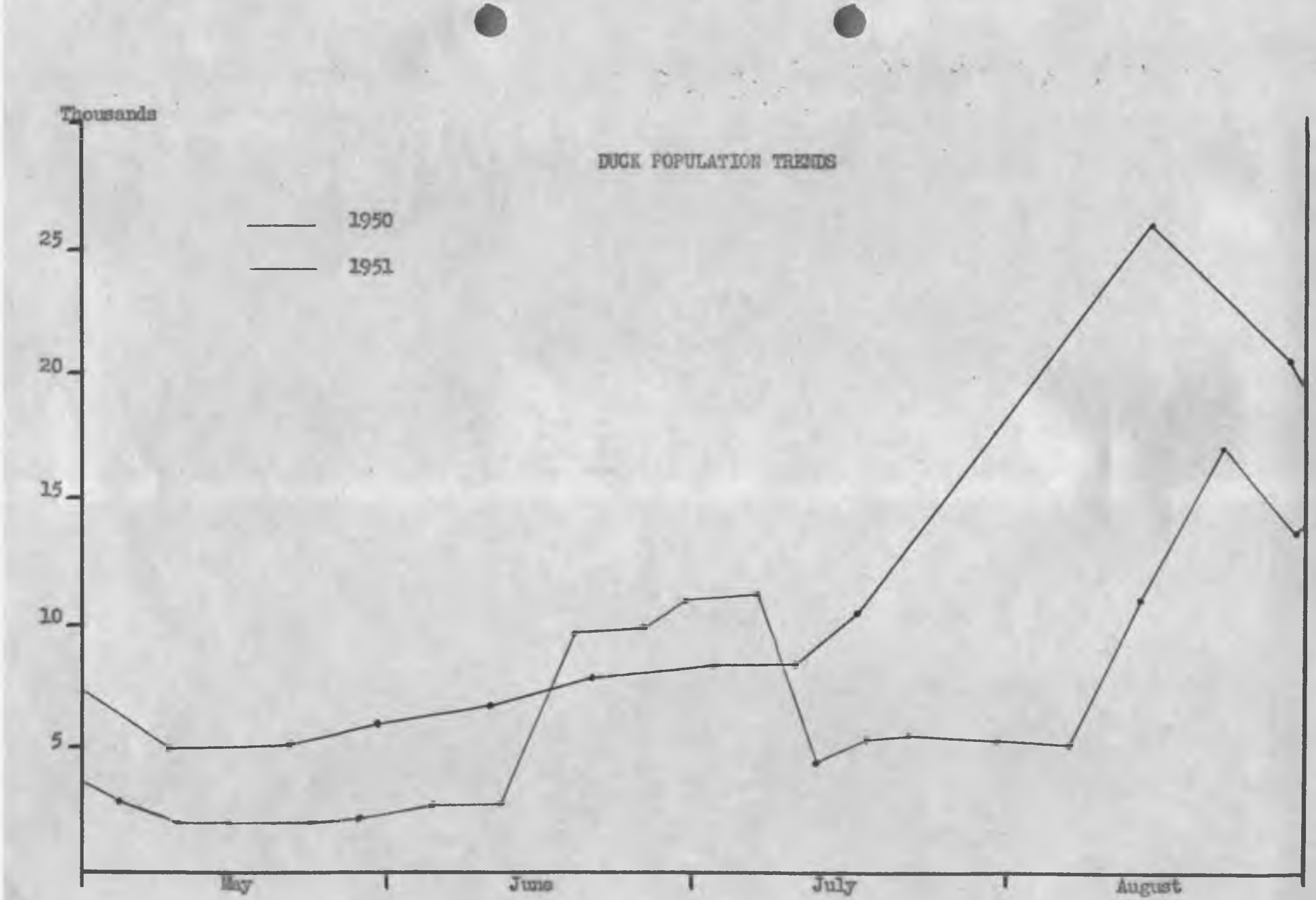
Like last year we used this count to determine our production. An arbitrary figure of 25% is subtracted for each species to take care of the unsuccessful pairs. To obtain a production figure for each species, the number of successful pairs was multiplied by the average number per brood as outlined by Dr. Griffith's summary of waterfowl brood count data, which was submitted to us with Mr. MacDonald's circular letter of May 29, 1951. An exception to this was the figures for the Canada goose and baldpate. Here we counted nearly 100 percent of those broods hatched, thus obtaining reliable data from our own brood counts. For the other species we appreciated receiving Dr. Griffith's summary as our own brood data have been statistically found, by means of Fisher's "F" test and others, to be too incomplete for drawing any conclusions on mean brood sizes.

Our completed map showing the location of nesting pairs by map tacks again showed us the distribution of nesting pairs in relation to habitat types; this year with different water conditions.

During the nesting pair count notes were also made on other waterbirds and shorebirds so as to have a basis for nesting population determination for these species.

The accompanying graph shows how our duck population ran for the period as compared to 1950. In general, only nesting ducks were left by May 10th. From then on duck numbers gradually rose, as drakes who had completed their martial duties, and those who didn't succeed in finding a mate, began to gather in ever increasing numbers in the Big Water and Nutgrass Areas. These drakes probably included our own in addition to those from outside the project. By the middle of August large numbers of northern migrants were in, including over 12,000 pintails, a bird which breeds here in only token numbers. Our duck population then took a sudden swing downward, as the Nutgrass Area and Big Water became all but dry. It is these two areas which support migrants in greatest numbers. Although our population went down with the drying of these two units, the reverse appeared true for the rest of Lahontan Valley where farmers reported unusually large concentrations in their grain fields.

In addition to the Big Water and Nutgrass Areas some use was made by migrants of other portions of the Stillwater Marsh, including the south end of the Stillwater Point Reservoir and shallow ponds at the north end of the marsh. About the middle of August a portion of the Pelican Island marsh became indunated and was used by several thousand pintails and green-winged teal.


Thousands
DUCK POPULATION TRENDS
1950
1951
25
20
15
10
5
May
June
July
August

The most gratifying situation we have to report on is a nesting season which exceeded all expectations. It proved the Area is potentially a good breeding ground and is not too far south for this purpose. The Stillwater Marsh had an increase of 118 percent over 1950 in nesting pairs of ducks and geese. The breakdown on this is shown in the following table.

Table I. Nesting Waterfowl Pairs in Stillwater Marsh for 1950 and 1951 With Percentage Increase in 1951.

	Number of Pairs 1950	1951	% Increase
Canada Goose	15	30	100
Mallard	70	162	131
Gadwall	125	194	55
Baldpate	2	3	50
Pintail	12	36	200
Green-winged Teal	0	3	300
Cinnamon Teal	320	736	130
Shoveller	10	51	410
Redhead	640	1419	122
Ruddy Duck	30	58	93
Total Ducks and Geese	1224	2672	118
Coot	1490	1651	11
Total Waterfowl	2714	4323	60

This increase can be attributed to several factors, the primary one being favorable water conditions. By favorable water conditions we mean all fringe ponds, alkali weed (Echinopsilon hyssopifolium) flats, the Nutgrass Area, saltgrass borders and even some greasewood areas were indunated. It is in such areas as these, where marsh plant succession is at early stages and flooding has been intermittent that nesting pairs established themselves in greatest density. Our map shows that at least 70% of our increase in pairs of ducks was represented by pairs that established themselves at locations that were dry last year, yet the actual acreage under water this year, excluding the Big Water where practically no nesting occurred, was but 14% above last year. In other words, 14% additional water area accounted for a 70% increase in pairs.

Other factors which the nesting pair increase can be attributed to include an increase in the number of muskrat houses which provided more loafing bars and goose nesting sites and additional shoreline and edge created by dikes built last summer. These dikes also helped by keeping the water high on the west side of the marsh.

The 70 percent increase in duck pairs on 14 percent additional water area is another approach to explaining how good habitat here does not exist where water is permanent and more or less stabilized, as under these conditions marsh vegetation rapidly goes towards marsh climax types. Like last year, the map becomes more devoid of pairs where the vegetation assumes this character. An example of this is some 4500 acres of Typha spp. and Scirpus acutus in the marsh. Most of this acreage is represented by solid stands which are not used as nesting territory. This amounted to 34 percent of this season's water area. Excluding the Big Water and Stillwater Point Reservoir, the map shows the marsh has 190 miles of shoreline, yet 62 percent, or 117 miles, of this shoreline is not used because Typha or Scirpus acutus grows up to land, thereby offering no avenue for a nesting duck to reach open water. From our map we obtained much additional data on those sites chosen for territories, including an evaluation of various vegetation types. This material will be submitted later in a special report.

In addition to the Stillwater Marsh, the Indian Lakes came forth with their share of ducks. The 52 acre seep lake there had close to 50 territorial pairs and contained at least 350 ducklings in early August. The Pelican Island Marsh became practically dry during the nesting season. Luckily, but one duck nesting pair, including nest, was seen there. One or two pairs of geese also nested on this marsh. Table II shows waterfowl pairs for the entire Area.

Table II. Nesting Pairs in 1951 Over the Entire Management Area

	Stillwater Marsh	Indian Lakes	Pelican Island	Total
Canada Goose	30		2	32
Mallard	162	10		172
Gadwall	194	57		251
Baldpate	3	12		15
Pintail	26	6	1	33
Green-winged Teal	3			3
Cinnamon Teal	736	26		762
Shoveller	51	2		53
Redhead	1419	8		1427
Ruddy Duck	58	2		60
Coot	1651	17		1668
Total	4333	140	3	4476

Elsewhere in this report the difficulty in obtaining sufficient brood counts was mentioned. Table III shows 1951 brood count and production data. The inadequacy of our brood counts is illustrated by the table where only too often Class II and III broods averaged larger than Class I's. It is of interest that only 14 percent of

Table III. 1951 Waterfowl Production Data. Number of Broods Counted and Their Mean Sizes

Species	Class I		Class II		Class III		Total All Classes		No. Broods Estimated Hatched	% of Broods Hatched Seen	Production
	No.	Mean	No.	Mean	No.	Mean	No.	Mean			
C. Goose	11	3.45	7	3.43	6	4.66	24	3.75	24	70	90
Mallard	10	6.90	16	5.93	9	6.66	35	6.40	129	27	841
Gadwall	36	7.08	19	7.21	2	8.00	57	7.17	188	30	1332
Baldpate	8	7.25	2	7.00	0		10	7.20	11	91	79
Pintail	0		1	2.00	2	10.50	3	7.66	25	12	152
Cin. Teal	36	6.47	25	6.12	2	4.00	63	6.25	571	11	3745
Shoveller	4	8.25	6	6.50	2	10.00	12	7.66	40	30	253
Redhead	83	6.90	65	6.09	13	5.76	161	6.48	1070	15	6751
Ruddy	0		5	6.20	0		5	6.20	45	11	240
Coot	43	2.74	35	2.43	12	2.75	90	2.62	1251	14	1841
Total	231		181		48		460		3354	14	18,324

Except for the Canada goose, it is felt few, if any, broods were counted more than once. Figure for number of broods hatched based on territorial pair count minus 25%. Mean brood size probably significant in case of Canada goose and baldpate. Elsewhere the number of broods counted too small and production figure obtained by multiplying number of broods estimated hatched times average brood sizes given in Dr. Griffith's summary of waterfowl brood count data compiled over the country.

those broods estimated to be present were seen.

Peaks for Class I broods occurred up to two weeks earlier than 1950.

Data by species for waterfowl and by groups for other waterbirds and shorebirds follows.

Whistling Swan. Strangely, one was seen by Giles on June 21 near the west end of the Nutgrass Dike.

Canada Goose. We still can't claim good goose production, but our nesting population of these birds has, nevertheless, steadily risen since 1949 along with the increase in muskrat houses. In addition to the nesting honkers, a small flock of non-breeders running up to 50 birds was periodically seen in May and June. Later the number of flocked honkers rose to a peak of 1800 noted on the August 15th census. As the Big Water and Nutgrass Unit dried up, numbers then declined to about 500 at the close of the period. In addition, to these two areas, honker flocks also made heavy use of the south end of the Stillwater Point Reservoir, which was used as a resting area in conjunction with nearby farmland used for feeding. Peaks and drops in the population curve occurred at exactly the same time as last year, but the 1950 high of 2800 was not attained. Honker nesting pairs were widely scattered throughout the entire Stillwater Marsh. At Class II and III stages, parents with their broods congregated on Foxtail Lake, Pool 3877, Tule Lake and the Stillwater Point Reservoir.

Snow Goose. Of particular interest was one seen by Giles on June 21 near the west end of the Nutgrass Dike. Presumably it, like the swan, was a cripple. At least two snow geese spent all, or part, of the summer of 1949 with us; none in 1950; this one in 1951.

Mallard. The breeding population of 172 pairs plus excess drakes was swelled by drakes which began arriving on the Big Water and Nutgrass Areas by the first of June to moult. Their numbers grew to some 8,000 by August 15th when females and young presumably joined the males. The peak in 1950 occurred on August 22 with about 5,000 being present. We were fortunate this year in finding six mallard nests, seemingly a small number but more than we have found in the past. The important fact about the nests is that five were located under burro-weed (Allenrolfea occidentalis) shrubs and one under a greasewood shrub. All were in locations where the saltgrass was high enough to be used as nesting cover, but the birds chose the protection afforded by the shrubs where the nests could not possibly be affected by livestock no matter how heavy spring grazing might have been.

Gadwall. At the start of the period only a nesting population of gadwalls was present. By the middle of July males began to congregate with the mallards in the Nutgrass Area. The gadwall population reached a peak the last of August. The pattern last year

was the same. Lake last year, the gadwall was by far the heaviest nester in the Indian Lakes whereas it ranks third in the Stillwater Marsh. One gadwall nest was found under a burro-weed shrub.

Baldpate. Production of baldpates was restricted almost entirely to the Indian Lakes, where they were found nesting last year for the first time in the Lahontan Valley. Last year over 2,000 migrant baldpates were in by August 22, but this year baldpates migrants failed to arrive in any numbers by September 1st.

Pintail. So few pintails nest here that they are hardly worth mentioning, but it is this species which makes up the bulk of the fall flights. They appeared in real numbers on August 15th, a week earlier than last year. By the latter part of the period we had some 10,000, about 8,000 more than for the same time in 1950.

Green-winged Teal. In the Stillwater Marsh two pairs of these birds were seen. These two acted like nesting pairs, but no broods were seen. Migrant green-wings were last seen on May 10 and not until the August 15th census did any show up again. By August 29th the population was estimated at 3300. Migrants of this species left us about May 5th in 1950, and appeared again in numbers on August 22.

Blue-winged Teal. Although ten males of this species were seen on six occasions in 1949 and 1950, but one was seen this year. This was on July 3rd.

Cinnamon Teal. As in the past, this species was the second most abundant breeding duck. Unlike most other species, peak numbers for cinnamon teal occur during the nesting season. Our full complement of breeding teal did not arrive until about May 22nd. Our own population was supplemented by additional drakes that came in from the outside to moult, the latter part of June. The last of August saw our cinnamons leaving us, as is customary at that time. Unlike 1949 and 1950, we managed to see a good proportion of the cinnamon teal broods.

Shoveller. We had a 410 percent increase over last year in nesting shovellers on the Stillwater Marsh this year, but, nevertheless, the nesting population is low. Our big spring influx of shovellers were gone by the first census in May. No migrants were seen again until the August 15th census. Once again, the pattern was the same as in 1950.

Redhead. Our most abundant duck nester, the redhead, again turned up on every marsh pond that contains food. Redheads came in through May and by the last few days of month our full breeding population was reached. About July 10th drake redheads, presumably from this Area as well as others in the valley, began gathering on the Big Water, and in the Nutgrass Area, to moult but by August 15th practically all of these in addition to our hatch had left. Such was the story in 1949 and 1950. Our young redheads and cinnamon

teal leave with their parents practically the day they can fly.

Canvasback. As in the past, stragglers were seen during the latter part of the period.

Scaup. A male was present in the Indian Lakes on June 26th.

Bufflehead. One was seen May 10th.

Ruddy Duck. During May migrant ruddies left us and we had only a nesting population of an estimated 60 pairs left. Most ruddy nesting took place in the Nutgrass area. No late summer influx occurred. The pattern was the same in 1949 and 1950 except this year we did not have the big concentration of non-breeders that was present on one of the Indian Lakes during the two previous years.

Coot. The coot again topped all other waterfowl combined in numbers of breeding pairs. The increase in nesting pairs was up 11% over 1950. Unlike other species of waterfowl, coots breed over the entire marsh. For this reason the 14 percent increase in water area did not have such an effect on them. We have every opportunity to see young coots here, but seldom do we ever see a complete brood. For this reason, our coot brood counts run very low. Whenever we watch a coot brood for an extended period of time, we usually find that over half the brood has been hiding in emergent vegetation. So many coot nests were spotted this year that we didn't stop to take data on all of them. The usual number of eggs was eight. Coots were most numerous before and after the nesting season. By August 15 the population was estimated at over 20,000, the greatest number of coots ever recorded on the Area at this time. The mid-August coot population in 1950 was estimated at half this amount.

Other Waterbirds and Shorebirds. Table IV shows the estimated nesting population for these groups as determined by notes made during the waterfowl nesting pair inventory. Data by groups follows.

Grebes. Like last year several eared grebes built floating nests of sago pondweed on the 52 acre seep lake in the Indian Lakes and several pairs were also present in the Stillwater Marsh. A migration of around 160 eared grebes appeared in the Indian Lakes on August 29. Western grebes nested on every large pond of the Area in their usual numbers and pied-billed grebes made themselves conspicuous in the Stillwater Marsh by their calls. So frequently were their calls heard that it appears we have either overlooked many of these secretive birds in the past, or this is the first year they have appeared in large numbers.

Pelicans and Cormorants. Like last year, the number of white pelicans using the Area gradually dropped in May. By the last of August only about 200 of an original 1000 were seen at any one time. Their numbers appeared slightly lower than last year. Double-crested cormorants appeared on the Area in only small numbers, nine being

the largest number seen in one day this period.

Herons, Egrets and Ibis. Rather than having one large marsh rookery as last year, this group used three rookeries this year. All three of these rookeries were located in stands of Scirpus acutus. All were in the Stillwater Marsh as follows:

One at the northwest corner, which was primarily used by blue herons; another one-half mile east of Swan Lake, which was primarily of black-crowned night herons; the third one mile northeast of "D" Dike, which was primarily of snowy egrets and white-faced glossy ibis. The rookery near Swan Lake was checked by four observers. Estimated present there were 13 blue heron nests, 160 night heron nests, 14 snowy egret nests and 28 ibis nests, a total of 217. This rookery was estimated as having 1,298 nests in 1950. Aerial surveys served as the only check on the other two rookeries, although both were seen from the ground on the waterfowl nesting pair count. The number of birds using them was little more than a guess. These rookeries take in 20 to 50 acres each, in waist-deep water. The vegetation towers high above a man's head. It takes several men and a day or more time to get any kind of an estimate of the number of nests each rookery contains. For this reason we had time and manpower to look into only one of them. Unfortunately, it was probably the smallest. In addition to the above three rookeries, two snowy egret and ibis rookeries were present on the Canvasback Gun Club and one blue heron rookery was located in cootonwoods on the Freeman Ranch, making a total of six heron rookeries in the Stillwater Marsh Area. Snowy egrets became especially conspicuous in August, when hundreds of them fed with shorebirds on the mud flats left by the receding Big Water. During the nesting pair count a total of eleven American bitterns were seen, a sizeable number for this secretive bird.

Rails. Both soras and Virginia rails seemed more conspicuous than usual. Several Virginia rails could be seen at one time at Structure No. 16 where they ventured a short distance out from vegetation to feed in the mud.

Shorebirds. We had five species of shorebirds nesting but avocets and stilts were the only really abundant ones. These two birds put on quite a show for visitors along the dikes, where they nested inches from the wheels of passing vehicles. After the breeding season avocet and stilt families gathered and fed along the Big Water. We were fortunate this year in finally finding nests and young of the snowy plover. The nests were the first found for the State. The migration of dowitchers, least sandpipers, western sandpipers and Wilson phalaropes did not seem as large as last year, but greater numbers of marbled godwits were seen. Most of these migrants were absent only during the month of June. Black-bellied plovers were again seen in May, this time at Pelican Island.

Gulls and Terns. Caspian terns and California gulls again

Table IV. Estimated 1951 Nesting Population of Waterbirds and Shorebirds

Species	Stillwater Marsh	Indian Lakes	Pelican Island	Total
Eared Grebe	4	6		10
Western Grebe	287	8		295
Pied-billed Grebe	440	6		446
Great Blue Heron	200			200
American Egret	10			10
Snowy Egret	400			400
Black-crowned Night Heron	320			320
American Bittern	90			90
White-faced Glossy Ibis	200			200
Virginia Rail	60			60
Sora	300			300
Snowy Plover	50			50
Killdeer	118	40	50	208
Avocet	1360	116	500	1976
Black-necked Stilt	573	12	310	895
Wilson's Phalarope	26	4	25	55
California Gull	200			200
Long-billed Curlew	2			2
Forester's Tern	125			125
Caspian Tern	100			100
Total	4865	192	885	5942

nested on the little island in the Stillwater Point Reservoir. The gulls seem about to take over this third of an acre, as they produced over 100 young on it while the terns produced only 60. Last year was the first time gulls used the island. A large Forester's tern colony was found in the Nutgrass Area. The largest number of black terns we have seen on the area, over 100, appeared over the Big Water on July 31st. As usual, ring-billed gulls didn't nest here, but appeared in late summer.

2. Food and Cover

With high water, food conditions for waterfowl were above average for the first of the period, but later our drying up the Nutgrass Area and Big Water left migrants without their main source of supply. Then Too, our sago pondweed (Potamogeton pectinatus) appeared in thinner stands than last year. This is important as this plant is the principal waterfowl food for the Area. The field investigation and research section of this report contains a discussion of our sago problem and how it does best here with periodic inundation rather than under permanent water conditions. Possibly the permanent water conditions of the last several years are a factor in this year's poor crop. From another standpoint, the high water has been favorable, as it flooded such very intermittent water areas as alkali weed flats as well as those supporting Eleocharis palustris. This means we will produce this year a good seed crop of the latter and such plants as alkali mallow (Sida hederacea).

The food situation is looking up in some of the Indian Lakes, which were formerly barren, as some of them now have fair stands of Potamogeton americanus. These lakes are new and unlike the Stillwater Marsh, plant succession is slow in their sandy soil. Possibly they will produce more food plants in the future.

The high spring water at Pelican Island created conditions for food plant production there for the first time in years.

As for cover, our problem is too much in the Stillwater Marsh, and possibly not enough in the Indian Lakes. Cover production at Pelican Island should be discouraged so as to prevent nesting there, as it goes dry about the time broods would come off.

3. Botulism

From July 20 until the Big Water became dry, about September 1st, we lost an estimated 100 ducks, presumably to botulism. No great amount of birds died at any one time. Three or four sick birds were the most seen in any one day. Except for about five birds that died from feeding in the mud along the north side of "D" Dike, all deaths occurred along the Big Water.

4. Lead Poisoning

None known.

B. Upland Game Birds

Except for a pair or two of valley quail that nested in the Indian Lakes and along the Carson River, use by upland game birds of the Area is sporadic. One pair of quail with young was seen on June 19th in the desert between the Hunter Drain and the West Canal about one-half mile north of the road to our shop. Undoubtedly, these birds came from private farmland which was about one-half mile away. Practically all our upland game bird use is sporadic, as this example shows.

C. Big Game Animals

None seen this period.

D. Fur Animals, Predators, Rodents and Other Mammals

1. Fur Animals

A. Muskrat

Summer is a poor time to evaluate muskrat populations, but every indication points towards our having another jump in "rat" numbers.

B. Other Furbearers

Large numbers of badgers have suddenly appeared, seemingly from nowhere, in the Paiute Waterfowl Food Plot area and in the vicinity of East and Cottonwood Lakes, in the Indian Lakes Area. They like best to show off their digging ability in our roads.

2. Predators

No coyotes were seen during the period although tracks indicate the presence of a very small number in the Stillwater Marsh Area. Apparently we have even fewer of these animals than last year.

3. Rodents

There has been no noticeable change here.

E. Predaceous Birds

For the first time we have detected some avian predation. One

or two prairie falcons were present in the Stillwater Marsh Area through June. One was found on June 5th feeding on a freshly killed hen redhead, which contained almost fully developed egg. In August Fred Wright, State Waterfowl Technician, observed a Swainson's hawk knock down and kill a ruddy duck in the Indian Lakes. Several ravens were present in the marsh most of the period and a few magpies were present in the Indian Lakes. From the above, it can be seen that the number of predaceous birds using the area is hardly worth considering.

F. Fish

As far as is known conditions for fish were normal during the period.

III DEVELOPMENT AND MAINTENANCE

A. Physical Development

Working conditions during the period were, on the whole, excellent. Weather caused a 3-day cessation of field work in August, but otherwise has been favorable. Water loss, through evaporation, has been below normal, but we had no trouble in drying the Pintail Bay Unit to facilitate work on Pintail Bay Dike.

A brief summary of job accomplishments is as follows:

Swan Lake Dike. Fill and grade on this dike is now complete. This dike, running north and south through the center of the marsh, is a part of the impoundment system designed to permit water control. It is now being used to withhold water from the east half of the marsh in order to permit construction work in the Pintail Bay and Nutgrass Units.

Pintail Bay Dike. The flood last winter prevented completion of this dike. Work has been started to bring it up to final grade. It has also been found necessary to lengthen the dike, and a two mile extension is under construction. This job is about 75 per cent complete.

Dike at Structure No. 2. A dike, 1700 feet long, necessary to prevent run-off from Foxtail Lake when this lake is raised to proposed level. The fill is approximately 50% complete.

Dike at Structure No. 4. This structure is also set in a low area and will have to be tied-in to high ground on either side with a dike. The fill on this dike is about 60% complete.

Lead Lake Canal. The Lima dragline started on this canal August 14th. So much time was spent on repairs and adjustment that little

was accomplished during the remainder of the month. Approximately 1200 yards of dirt were moved.

Paiute Drain. The section of the Paiute Drain necessary to drain the 100 acres of Paiute Waterfowl Food Plot being developed has been excavated.

Paiute Canal Check No. 2. A headgate in the Paiute Canal needed for irrigating the Paiute WF Plot. This structure was poured and backfilled.

Paiute Check-drop Structure. This structure, necessary for building a head of water for irrigating the Paiute WF Plot was poured in July.

Marsh Structure No. 2. The hole for this structure, 25' x 60' and 8' deep was dug by the Lorain dragline. Forms, designed for smaller structures, were enlarged to take care of the increase in height and the length of wingwalls. Concrete aggregate was hauled from Lahontan Dam, a distance of 45 miles, and piled at the structure site.

Paiute Waterfowl Food Plot. Most of the preliminary construction on the 100 acres of this WF Plot has been completed. The control dikes surrounding each 20-acre field have been built, the central irrigation lateral has been excavated, and 6 concrete pipe turnouts and one lateral check installed. Preliminary work still to be accomplished consists of riprapping, installation of flashboards and land levelling.

Salt Cedar Control. Between May 22 and June 29th twenty-four man days were spent in salt cedar control. It is a little difficult to determine the amount of ground area involved since much of the salt cedar occurs as a marginal growth along the high water line of the marsh. It is estimated, though, that the stand will cover approximately 10 acres. Some rather extensive areas do occur on low wet ground.

Two methods of control were used. About 60% of the salt cedar was treated with 2,4-D applied from a power sprayer mounted on the back of a jeep. Hand removal took care of the rest. Most of the plants were small enough to be hand pulled though an occasional bush had to be dug out by shovel.

Hand removal was resorted to in areas where the growth was too thin to justify spraying or where the ground was too wet to permit the operation of a jeep.

As yet we do not have any continuous stands of sufficient size to warrant the application of spray by airplane.

The spray used was a 44% 2,4-D ester. It was mixed with water

in the proportion of one gallon of ester to nine gallons of water. To each 10 gallons of mix was added one-half pint of detergent (Fab) which served as a wetting agent.

The results are still undetermined but presumably should be the same as those achieved the previous year when 100% kill was obtained on very young plants and about a 75% kill on larger plants 4 to 7 feet high.

The total cost per acre was $44.08.

We asked our man, Brooks, if he were doing any good, along toward the end of the project. He grabbed a handful of new plants and painfully straightened his aching back.

"Well, I'll tell you", he said. "If I put in full time at this job of spraying and pulling, I would have to quit at the end of 10 years. The darned stuff would be so thick around me, I wouldn't have room to work."

At that time the seeds were rapidly germinating and each morning he would find 10 new seedlings where he had pulled one the day before.

Equipment. Several items of equipment were added during the period.

A bench saw, powered by a 3/4 hp. A/C electric motor was constructed. This has really been a time saver in the construction of forms for concrete structures.

Another worthwhile piece of equipment is a half-yard concrete bucket also built in our shop. It is to be used on our bigger marsh structures and will be handled by the P&H dragline. A concrete bucket not only reduces hard manual labor to a minimum, but speeds up the operation enormously. We do not intend to get rid of the wheelbarrows, however. They still have their place on smaller jobs.

Refuge personnel made a trip to the Little White Fish Hatchery at Bingen, Washington, in July to pick up a Worthington air compressor having a capacity of 350 cubic feet per minute.

Also, during the period, we secured a lathe from Navy surplus. It is a fairly nice piece of equipment, having a 14-1/2" swing and a 6' bed. It came camouflaged under a heavy coat of cosmoleme, lacked a tool holder, had a couple of minor parts proken, and had a one hp, direct current motor whereas we need A/C, but it is well worth fixing up. There was no charge for the lathe except freight on the 2,600 pounds involved.

During the period the Lima dragline underwent extensive repairs on the tracks. The track pads were so thin they were beginning to show through. A liberal application of welding rod reinforced the

thin spots and the machine is now operating. Further repairs will be impossible and the next breakdown will necessitate the purchase of new tracks and rollers.

The R-5 Caterpillar tractor is still down. The maintenance of other equipment, more urgently needed has prevented our completing the major overhaul on this tractor.

Equipment Transfer. Five dump trucks went out on transfer during the period. This leaves us with four dump trucks, one of which was converted to a grease truck, back in 1949. Bowdoin received a 3-ton Reo and a 1-1/2 ton Chevrolet. Tule Lake, Ruby Lake and Merced each received a 1-1/2 ton Chevrolet.

B. Plantings

1. Aquatic and Marsh Plants

A planting of prairie bulrush (Scirpus paludosus) seed was made early in August. This is a little early for planting but water conditions necessitated getting the seed in the ground. One of our proposed lakes (we have considered calling it Dry Lake because it has taken so long to get water on it) had to be used as a dumping ground for some of the water that would otherwise go into an already overflowing marsh. Therefore, we decided to plant the seed while the ground was still dry.

The proposed waterline in Dry Lake is at elevation 3889. On August 8th we used a level to establish this contour line. Then, on August 9th, we planted the seed in a border strip using the 3889 level as the upper margin.

The bulrush seed contained too much trash to be put through a drill so it was hand sowed. We merely pulled a 16-foot spike-tooth drag (home-made) behind a jeep and broadcast the seed in front of the drag. To insure the seed being well covered, we added a 25-foot length of log chain behind the drag. This type of equipment worked quite well since the lake bed was barren and was relatively free of irregularities.

The border strip thus planted was 4 miles in length and averaged 30 feet in width. Total area was approximately 14-1/2 acres. The bulrush seed was planted at the rate of 34 pounds per acre.

2. Trees and Shrubs - None

3. Upland Herbaceous Plants - None

4. Cultivated Crops

None planted but we have been pretty busy irrigating 100 acres planted last spring.

C. Collections

Mechanic General Ruff and Automotive Mechanic Olano made a trip to Tule Lake Refuge on August 20th to aid in the dismantling of the combine for transfer to Stillwater for the harvest of the alkali bulrush seed on the Nutgrass Area.

By the end of August 12,600 pounds of the bulrush seed had been combined by Labor Leadman Brooks and a laborer, Stark. Due to high winds the harvesting was slow, but we felt very successful.

D. Receipts of Seed and Nursery Stock

There were no receipts of seed and nursery stock during the period.

IV ECONOMIC USE OF REFUGE

A. Grazing

The high water conditions of last winter resulted in more forage than usual for graziers. Winter and spring rains also permitted some desert grazing, although the livestock did not exist solely on desert food. The Carson River flood plain came up with green growth for the first time in years as a result of the flood. The Pelican Island Marsh came up with fresh growths of saltgrass and alkali bulrush. Generous growths of alkali weed, a favorite food, came up in the flats flooded by the winter's high water in the Stillwater Marsh. A greater amount of cattle used the area as a result. Accurate numbers were not kept, but an aerial check on July 17 showed the presence of 465 head at Pelican Island; 446 head in the Stillwater Marsh; 20 head along the Carson River and 146 head in the Indian Lakes. The total of 1077 head includes 157 head of horses. These figures are for public domain. Additional animals were on unfenced private ground within the Area boundary. Most of these animals were put out in May, and this census was made as the livestock numbers reached their peak.

Those animals in the Stillwater Marsh grazed most heavily along the mainland in the north-central and northwestern edges. Their numbers were too great as they did considerable damage by removing seed heads from alkali bulrush. We can accomodate around 400 head in the marsh from July the fifteenth through September fifteenth to advantage, but only if they are distributed evenly throughout the marsh.

B. Haying

None

C. Fur Harvest

None

E. Other Uses

The Grastiet Fishing Co. has removed 20,000 pounds of carp from the waters of the Stillwater Wildlife Management Area by the use of traps during the report period.

V FIELD INVESTIGATION AND RESEARCH

A. Progress Report

1. Marsh Study Plots

The vegetation quadrats and transects established in 1949 and 1950 were checked again this year on August 17th.

Of significance was a ten foot extension of cattail at our transect on the Stillwater Point Reservoir and dead, or dying, growth at the quadrats and transects on Foxtail Lake. We have no explanation for the latter situation except that the soil is high in sodium carbonate which is apparently increasing. The dead or dying vegetation is several acres in extent and is one of several similar areas of dead vegetation which exist elsewhere along Foxtail Lake. All emergents in the affected areas, which include saltgrass, alkali bulrush and cattail, are dying.

B. Final Report

1. An Investigation of the Factors Affecting the Growth of Submerged Aquatic Plants on the Stillwater Wildlife Management Area

General. All of our field observations since the start of the Stillwater project have indicated that waterfowl make little use of the west portion of the Stillwater marsh except for a few of the shallow, marginal ponds. The reasons for this lack of utilization are apparent. The ponds are comparatively deep and turbid, they lack aquatic growth, and are surrounded by wide zones of dense cattail. Since they produce no food and possess an undesirable type of cover, they are not used by waterfowl to any extent at any season of the year.

Because much of the west portion of the marsh is of little value to waterfowl we have made an attempt to determine those factors which prohibit the growth of waterfowl food plants in this area. The influence of the heavy cattail growth was obvious, but the absence of sago pondweed, so abundant elsewhere in the marsh, presented a problem. Marsh management in the future will have to be founded on an understanding of the habitat requirements of desirable waterfowl food plants. Factors limiting or prohibiting the growth of such plants will have to be controlled in order to gain habitat improvement.

Lack of aquatic growth in such marsh areas as Lead Lake, Millen

Channel, Willow Lake and Swan Lake was at first thought to result from the high turbidity of these water bodies. These lakes are noticeably dark at all times of the year. They are comparatively deep, though are well within the depth tolerance of sago pondweed.

Procedure. In order to determine if turbidity was the limiting factor we have made a series of light penetration measurements, comparing our barren waters with those which are producing sago. These tests were started in July, 1951, and were repeated at intervals of approximately one month with the exception of a three-months period during the winter.

Various stations were established in the marsh, and comparative readings were made with a Secchi disk. This instrument consists of a circular disk, 8 inches in diameter, which is divided into quadrats painted alternately black and white. The disk is lowered into the water until it disappears from sight. This depth is then recorded.

The readings obtained are comparative only and are used as an indication of light penetration. They are not a measure of turbidity since such a measure is based on the quantity of suspended matter in the water.

Influence of Turbidity. The results of this investigation are of considerable interest. They do not provide a complete solution to the problem of sago pondweed distribution, but they do shed some light on the factors involved in water turbidity.

It became apparent that the character of the marsh soil is responsible for most of our turbidity. This soil is fine-grained silt, combined, in older parts of the marsh, with particles of organic material. Only slight water movement is required to agitate this silt after which it remains in suspension for long periods of time. We collected bottom samples at 10 of the stations, mixed them thoroughly with measured quantities of tap water, and then recorded settling time. Havier particles in the samples settled out in stratified layers. The time required for the complete deposition of these heavy particles varied from 5 hours to 18 hours and 15 minutes. Even after this lapse of time the water did not become clear. It remained noticeably colored, the color varying from light brown to gray depending on the content of organic material, for an indefinite period of time. Six of the samples were kept under observation for 24 hours while 4 were held for 48 hours with little perceptible change in color. This coloring material seems to be largely colloidal plus more or less organic stain. A water sample from Stillwater Point Reservoir retained most of this finely suspended material for a week and was still noticeably colored at the end of two weeks.

Secchi disk readings were made in the Stillwater marsh and the Indian Lakes. Additional readings were also taken on the Canvasback Club since the overflow from the Club provides the major source of

water for the western portion of our marsh.

Our most turbid water occurred in the Reservoir distribution system. This water system is still comparatively new so that a considerable proportion of the channels is still bare of vegetation. For this reason the current is continually scouring the channel banks and washing new material into suspension. The water from the Stillwater Diversion Canal, which empties into Stillwater Point Reservoir, carries a heavy load of silt picked up almost entirely within the length of the Canal. The Diagonal Drain, which empties into the Diversion Canal has a steep gradient along its entire 3 and 3/4 mile length, and its channel is still being eroded so actively that bank vegetation has never become established. The canal water picks up so much silt that a large delta is forming at the mouth of the canal. Furthermore, silt is rapidly filling the upper half of the Reservoir.

In the marsh the clearest open water is found in small ponds which are not connected to the water distribution system by open channels. In other words, small ponds which are not influenced greatly by wave action and which receive water filtered through marsh vegetation are the clearest. The presence of sago or other pondweeds is another factor of considerable influence. Pondweeds bind the bottom soil and not only dampen wave action, but tend to retard the spread of sediment stirred by the action of feeding carp.

In open ponds and channels on the Stillwater marsh the Secchi disk disappeared at depths varying from 4.5 to 23 inches. Actually the clearest water occurred in depths too shallow to permit use of the disk.

At the Indian Lakes we obtained disk readings varying from 8.25 to 13.5 inches in those lakes along the water channel. The Indian Lakes also include several seep ponds fed by underground water which are exceptionally clear. In the deepest of these we were able to see the disk on the bottom at 32 inches.

The following factors contribute in some degree to the high turbidity of our marsh water:

1. Silt character
2. Current (in canals, particularly)
3. Turbulence (at structures)
4. Wave action in the larger ponds
5. Lack of bottom, or bank, cover
6. Carp action

In addition to the above we had anticipated the possibility of increased turbidity in the spring and fall as a result of water turn-over. A series of temperature readings indicated, however, that water turn-over does not occur. The marsh water is too shallow to permit any great difference between top and bottom termperatures. The greatest difference recorded was 3 degrees; the usual difference being one to two degrees.

None of the factors causing turbidity can be eliminated entirely, but in some cases it will be possible to take remedial action.

Current in the canals will always be a factor though it will become somewhat less significant as vegetation becomes established along the banks. In considering this factor it is our belief that channels in the marsh proper should be limited to the minimum required for proper water distribution.

A considerable quantity of silt is necessarily picked up by water pouring through a structure. This could be reduced by covering the bottoms and sides of the canals with riprap material throughout the turbulent area.

The only feasible method of retarding wave action in the larger ponds seems to consist of establishing emergent plant growth, preferably hardstem bulrush, in belts to serve as wave-breaks.

submerged Bank cover along the ditches will appear in due time. The various aquatics, which constitute bottom cover, are present wherever conditions are suitable. There is little likelihood that they will spread into other areas of our present marsh system without artificial manipulation of environmental factors.

Carp action will be subject to periodic control in those parts of the marsh where our management will permit dewatering. These fish will be difficult to eliminate, however, as we are subject to continual reinvasion through the irrigation system.

The problem of explaining the presence or absence of sago pondweed still remains. Turbidity probably has a limiting effect on sago growth in the deepest ponds, but it is not the decisive factor prohibiting such growth.

In general, sago pondweed is found in the newer parts of the marsh, i.e., the Stillwater Point Reservoir drainage which has been in existence only since 1945. Sago also occurs in some other areas, usually in water less than 2 feet deep. It is absent from most of the older parts of the marsh, regardless of water depth. It does occur in fringe ponds adjacent to the older marsh areas, but these fringe ponds become dry periodically so that they are not old in an ecological sense.

Sago grows in Stillwater Point Reservoir in water which exceeds 4 feet in depth. The reservoir lacks any extensive emergent growth so it is subject to pronounced wave action. As a result turbidity is extremely high. Secchi disk readings ranged from 6 to 9 inches in the area of sago growth indicating a measurable light penetration varying from approximately 10% to 20% of the total depth.

Lead Lake, Willow Lake, and other water bodies lying along the original course of the old Stillwater Slough, yield a meager growth

of coontail but do not produce sago. Yet they are never as turbid as Stillwater Point Reservoir. Disk readings varied from 7.5 inches to a maximum of 20 inches indicating light penetration of at least 15% to 40% of total depth. Average water depth is comparable to that at our station in the Reservoir.

Adjacent to Millen's Channel, but entirely surrounded by emergent growth (cattail and hard stem bulrush), is a small pond, about 2 acres in size and 3 to 3.5 feet in depth, which has unusually clear water. It is separated from Millen's Channel by marsh growth only. There was a medium growth of bladderwort in the pond but no other aquatic plants. Light penetration, as measured by the Secchi disk, varied from 40% to 100%, the bottom being visible to the eye on one occasion. Turbidity is definitely not a deterrent to aquatic growth in this pond.

Influence of Soil. It seems evident that some environmental factor other than turbidity is responsible for inhibiting sago growth in the older marsh areas.

When it became apparent that the presence of sago was dependent upon factors not related to turbidity we made a field examination of the bottom soil at each station. We found that sago was usually present on those soils having the highest mineral content. The Reservoir and Foxtail Lake, being new water bodies, have silt bottoms and produce sago in spite of high turbidity. The old marsh ponds and channels, on the other hand, have muck bottoms which are unproductive.

This distinction held, as a rule, but there were several exceptions indicating that still other factors might be involved. Several ponds with muck bottoms do support sago. These ponds are, in a sense, marginal in that they become dry for short periods during short water years. Such periods of dryness, however, have not been of sufficient duration to have resulted in any extensive loss of organic matter through oxidation.

Conclusions. Further investigation of the requirements of sago pondweed needs to be undertaken. It appears, though, that such investigations might become too involved and time consuming to be carried out with refuge personnel. We are inclined to believe that the problem could best be handled by a plant physiologist.

We have concluded tentatively that sago growth might be promoted as a result of periodic dewatering. It would appear also that periods of dessication might have to be relatively frequent, and, in the older parts of the marsh, of rather extensive duration.

Until a solution to this problem is found, approximately thirteen precent of our open water area will remain a waste to waterfowl with the chance that more will go the same way.

VI PUBLIC RELATIONS

A. Public Uses

Visitor days of hunting, fishing and miscellaneous use will be tabulated on December 31st as per Mr. Krummes' memo of March 26, 1951.

B. Refuge Visitors

The following visitors were received in Fallon during the report period:

May 2 - William Petherbridge, Manager of Churchill County Chamber of Commerce; Harry Fitzwater, NAAS, Commanding Officer; Marvin J. Plyer, Flight Officer, spent one hour in the office discussing the boundaries of the Stillwater Wildlife Management Area in relation to the practice bombing that is to take place in connection with the Navy Air Station located in this valley.

May 13 - Dr. Frank Richardson, Professor of Zoology, University of Nevada, and Virgil Hart, Student, spent the day on the Area on heron rookery investigations.

May 24 - Fred Cook, Engineer, USN, spent one hour conferring on the refuge boundary.

May 29 - Dan Evans, Chairman of State Fish and Game Commission, Jim Wood, Chairman of Churchill County Game Management Board and Kirn Bradley, Member of Game Management Board, spent the day on a complete tour of the project in the company of Refuge Manager Horn. A complete description of the development program and the results of the work, including information on water management was given. All expressed surprise at completeness of development plan and the work accomplished to date.

June 4 - Dan Sequerra, Mariposa, California, spent an hour in the office discussing the hunting possibilties and laws of the valley.

June 12 - Fred Evenden and Dan Slater, River Basins, spent one hour in conference of the water use from Carson River.

June 29 - Harold F. West, Engineering Section, Regional Office, left after a stay that began on March 14, 1951, when he arrived to do survey work for the development work.

July 5 - Mr. and Mrs. H. D. Herold, Los Angeles Teachers Ass'n, spent one and one-half hours conferring on conservation investigations.

July 12 - Commander Johnson, USN, in Charge Construction, Fallon Base, spent one hour visiting in the office - "Just to get acquainted", as Johnson put it. He is the nephew of Oscar Johnson, FWS.

July 17 - Mr. MacDonald of Regional Office spent one day at Fallon
18 making an inspection tour of the Area; making arrangements with Mr. Horn for his coming transfer to Tule Lake and briefing the crew (Refuge staff) on problems to be confronted and eliminated and his hope that we would give to Mr. Giles, who succeeds Horn, the same cooperation that Mr. Horn had received.

Also at this time Mr. Norman Haugness was in Fallon to take delivery of one Chevrolet dump truck and one Reo dump truck that were being transferred to Bowdoin.

July 31 - Robert Boone and Elmo See, Regional Office, Nils Nilsson, PR Coordinator, State Fish and Game Commission, spent the morning in an audit of the State payrolls for the cooperative work program on this Area.

August 6 - Malcolm Allison, District Agent, and Vince Bogatich, of Predator and Rodent Control Branch, visited momentarily at our new office building - to give it the once over.

Mr. Thomas C. Horn, Refuge Manager, Tule Lake Refuge, spent the afternoon with Refuge Manager Giles and David B. Marshall at the TCID Board meeting relative to grazing.

August 13 - Mr. Elgan and Mr. Sprulli of Tule Lake Refuge were visitors for this day to make a waterfowl census with David B. Marshall and to take delivery of one of our Chevrolet dump trucks which was transferred to Tule Lake.

August 14 - Joe Rabb, Wildlife Technician, State Fish and Game Commission, spent one hour conferring on the waterfowl production of this Area.

C. Refuge Participation

The following meetings and conferences were attended by Refuge personnel and films shown during the report period:

May 1 - "Birds, Beasts and the Rainbow", film, was shown to 673 students of the Fallon schools.

May 7 - Refuge Manager Horn attended sportsmen meeting of the valley and approval of the agreement contained in Mr. Day's letter of Frank Groves, Director, Nevada Fish and Game Commission, was received.

June 13 - Refuge Manager Thomas C. Horn, Wildlife Management Biologist LeRoy W. Giles, Mechanic General Arthur V. Huff and Maintenance Man Earl W. Nygren, attended the GSA Equipment Maintenance meeting held at San Francisco, California.

June 25 - Refuge Manager Thomas C. Horn attended a conference in Portland at the Regional Office with the representatives of the Bureau of Reclamation relative to water rights on the Tule Lake Refuge.

July 13 - Accompanied by LeRoy W. Giles, Wildlife Management Biologist, and Mr. Colman, Nevada Fish and Game Commission, Refuge Manager Thomas C. Horn conferred with the Nevada Industrial Commission at Carson City relative to the Industrial Insurance rates charged for the employees on this cooperative development program.

D. Hunter Success. No hunting occurred on the Stillwater Wildlife Management Area during the period.

E. Fishing Success.

Excellent catches of bullheads and quite a few white catfish were made in May and June before the water became too warm. Very few black bass have been caught, but this was to be expected. Bass fishing, last year, did not become good until fall.

F. Violators. None

VII OTHER ITEMS

A. Items of Interest

Cigars were passed out twice in July. Both Refuge Manager, David B. Marshall, and Wildlife Management Biologist, LeRoy Giles, became fathers again. Giles on July 25 and Marshall on July 26. In each case it was a boy. In view of the cost of living we felt like the new father in the Saturday Evening Post cartoon who passed around a cigar box labelled "CONTRIBUTIONS ACCEPTED."

Thomas C. Horn, Refuge Manager, left July 25th to assume his duties as Refuge Manager of Tule Lake Refuge. LeRoy W. Giles, Wildlife Management Biologist is to be acting Refuge Manager at Stillwater.

Arthur V. Huff, who has worked at this station since November 1, 1950, as mechanic, received an appointment as Mechanic, General, CPC-8, effective May 27, 1951.

Earl W. Nygren, Maintenance Man, was promoted to Maintenance Supervisor, CPC-7, effective August 19, 1951.

The Fish and Wildlife Service labor crew at the end of this period consisted of:

Manuel Olano, Mechanic, Automotive
William H. Ogden, Mechanic, Automotive
Ernest J. Brooks, Labor Leadman

At the end of this period the State construction crew, PR employees on the cooperative development program, consisted of:

4 Laborers
2 Truck Drivers
1 Concrete Mixer Operator
4 Oilers
2 Tractor Operators
1 Elevating Grader Operator
1 Motor Patrol Operator
3 Dragline Operators
1 Concrete Crew Foreman
1 Warehouseman

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Reprinted from THE CONDOR, Vol. 53, May-June 1951, No. 3, pp. 157-158

New Bird Records for Western Nevada.—Alcorn (Condor, 48, 1946:129-138), Gabrielson (Condor, 51, 1949:179-187), and Linsdale (Pac. Coast Avif. No. 23, 1936) have published ornithological records from the Lahontan Valley and Carson Sink area of western Nevada. To supplement the work of these writers, the records to follow here seem worthy of note. All but that of the Arctic Loon were made on the 205,000-acre Stillwater Wildlife Management Area, which lies to the north and east of the town of Fallon, Churchill County. The loon skin is in my personal collection; all other specimens are in the United States National Museum.

Gavia arctica pacifica. Arctic Loon. The remains of an immature of this subspecies was picked up on April 9, 1950, from the shore of Soda Lake, approximately five miles northwest of Fallon, and sent to Mr. Jewett, who confirmed this identification. This bird had probably been dead for a month or more. This is, to the best of my knowledge, the first record of this loon in Nevada.

Mareca americana. Baldpate. Alcorn lists this species as a year-round resident in the Lahontan Valley, but reports that "no nests or young birds have been seen." On July 12, 1950, I collected from a brood of eight a young Baldpate which was passing from the downy to feathered stage. This brood, along with four other Baldpate broods, was in the Indian Lakes area.

Anas discors. Blue-winged Teal. Alcorn cites but one record of this species in the Lahontan Valley, a male taken on April 1, 1939, by Vernon Mills of Fallon. Since that time this bird has apparently become more numerous in this part of Nevada. Periodic sight records of male Blue-winged Teal, often accompanied by female teal, were made between May 16 and June 15 in 1949 and 1950 by LeRoy W. Giles, Vernon and Laura Mills, and the writer. As many as three males have been seen in a single day. Undoubtedly this species breeds here, although it is by no means abundant.

Bucephala albeola. Bufflehead. On one of the Indian Lakes, two Buffleheads extended their 1949-50 winter stay through May and June and up until July 12, 1950, when one of the birds was collected. After this the bird's partner disappeared. The Bufflehead collected turned out to be a male in the eclipse plumage and was consequently flightless. Alcorn lists the Bufflehead as a "winter resident. Seen in all months from October to June, inclusive." Linsdale does not record any summer records for the species in the state.

Charadrius alexandrinus. Snowy Plover. Linsdale says this species is "probably a regular summer resident in small numbers" in Nevada. My own observations show that it occurs in larger numbers and more frequently than supposed. On the Stillwater Wildlife Management Area it is seen in the Pelican Island Marsh, along the Big Water, and Stillwater Point Reservoir. These locations offer similar habitat—open alkaline lakes with a shoreline practically void of vegetation. My notes contain numerous sight records between July 7 and August 31, inclusive, in 1949 and 1950. On July 20, 1950, a flock of 50 was seen on the Big Water and on August 8, 1950, the four-mile long east shore of the Big Water had from one to several Snowy Plovers at intervals of 100 to 200 feet, making a total of several hundred birds. One plover was collected from the Big Water on July 15, 1949.

Charadrius hiaticula. Semipalmated Plover. One of this species was seen at the Big Water on August 22, 1949. On May 8, 1950, one from a flock of six was taken in the Indian Lakes. On September 9, 1950, a female, one of several, was collected from the Big Water; and on September 13, 1950, four were seen at the Big Water. So far as I can determine, the bird taken on September 9, 1950, is the first taken in the fall in the state. This species appears to be to a regular migrant in small numbers in the Lahontan Valley.

Squatarola squatarola. Black-bellied Plover. Linsdale fails to list this species, but Alcorn lists several fall records. My notes contain some spring records. On April 10, 1950, in the Stillwater Marshes I collected a male from a flock of twenty-eight. On April 18, 1950, at the same location I observed a flock of twelve, and on May 16, 1950, ten were seen at the Big Water.

Totanus flavipes. Lesser Yellow-legs. I have but one additional record of this uncommon species, a male taken on July 29, 1949, in the Indian Lakes.

Calidris canutus. Knot. On May 16, 1950, I obtained one of two Knots observed at the northeast edge of the Nutgrass Area. To the best of my knowledge, this constitutes the first record of this species in the state.

Erolia minutilla. Least Sandpiper. Linsdale and Alcorn fail to list any July records of this species. On July 13, 1949, I collected a female, one of two seen in the Stillwater Marshes.

Hydroprogne caspia. Caspian Tern. Linsdale fails to record any nesting colonies of this species in the state. Alcorn says, "A few nest each year on a small island in the Lahontan Reservoir." This

bird also nests on a bare island, one-third of an acre in size, in the Stillwater Point Reservoir. On June 15, 1949, eleven nests, containing only eggs, were counted on the island. Fifteen adults were also present. The island was next visited on August 5, 1949, when four young, not yet able to fly, and eighty-eight adults were counted. The colony showed a significant increase in size in 1950. On June 2, 1950, a total of 107 nests was counted along with over 100 adults. Intermingled with the tern nests were thirteen nests of the California Gull (*Larus californicus*). No young of either species had yet hatched, but all nests held from one to three eggs. The island was last visited on July 31, 1950, when sixty young Caspian Terns and seven young gulls were flushed into the water. A few of the young could fly.—DAVID B. MARSHALL, *U. S. Fish and Wildlife Service, Fallon, Nevada, October 2, 1950.*

WATERFOWL

REFUGE [redacted] MONTHS OF [redacted] to August . 19 51

(1) Species	(2) First Migrants Seen		(3) Peak Concentration		(4) Last Migrants Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
1. Swans:									
Whistling swan	1	6/21	1	6/21	1	6/21			1
2. Geese:									
Canada goose			1,800	8/15			24	90	1,800
Cackling goose									
Brant									
White-fronted goose									
Snow goose	1	6/21	1	6/21	1	6/21			1
Blue goose									
3. Ducks:									
Mallard	600	6/11	8,855	8/15			35	841	12,000
Black Duck									
Gadwall			1,184	8/15			57	1,332	1,500
Baldpate	20	7/3	120	7/11			10	79	300
Pintail	300	7/3	10,050	8/29			3	152	13,000
Green-winged teal	250	8/15	3,300	8/29					3,600
Blue-winged teal	1	7/3	1	7/3	1	7/3			1
Cinnamon teal			2,060	8/15			63	3,745	3,100
Shoveller	400	8/15	4,502	8/29			12	253	5,000
Wood duck									
Redhead			7,500	7/17			161	6,751	7,500
Ring-necked duck									
Canvas-back	30	8/15	30	8/15					30
Scaup	1	6/26	1	6/26	1	6/26			1
Golden-eye									
Buffle-head									
Ruddy duck			165	June			5	240	165
									26,000
4. Coot:			22,500	8/29			90	4,841	

3-1750
(June 1949)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese 90

Ducks 13,393

Coots 4,841

Total waterfowl usage during period 74,000

Peak waterfowl numbers 30,174

Areas used by concentrations Big Water, Mutgrass Area and Pelican Island

Principal nesting areas this season Stillwater Marsh

Reported by David B. Marshall

INSTRUCTIONS

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance.

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.

(5) Young Produced: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

61355

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Stillwater W. M. Area Months of May to August 1951

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe			160	8/29				5	10	160
Western Grebe			600	Aug.				150	??	900
Pied-billed Grebe			1,000	Aug.				220	??	1,400
White Pelican			1,000	5/10						3,000
Double-crested Cormorant			10	8/29						100
Great Blue Heron			800	Aug.			2	100	400	1,000
American Egret			35	Aug.			1	5	25	35
Snowy Egret			1,000	Aug.			3	200	600	1,000
Black-crowned Night Heron			800	Aug.			3	160	480	800
American Bittern			100	Aug.				Unknown	??	100
White-faced Glossy Ibis			400	Aug.			2	100	300	1,200
Virginia Rail			100	Aug.				Unknown	??	100
Sora			400	Aug.				Unknown	??	400
II. Shorebirds, Gulls and Terns:										
Snowy Plover			100	Aug.				25		100
Semipalmated Plover	10	7/31	10	7/31	10	7/31				10
Killdeer			400	Aug.				100		400
Black-bellied Plover	4	5/8	32	5/10	32	5/10				32
Long-billed Curlew	2	5/29	2	June	1			1		3
Spotted Sandpiper			8	7/31						8
Greater Yellow-legs	1	8/7	3	8/29	3	8/29				20
Peeps (Least & W. Sandpiper)			30,000	7/21						50,000
Dowitcher			20,000	8/15						35,000
Marbled Godwit	12	7/17	100	8/15						150
Avocet			3,000	Aug.				900		4,000
Black-necked Stilt			1,500	Aug.				400		2,000
Wilson's Phalarope			1,000	7/17				25		2,000

(over)

(1)	(2)	(3)		(4)	(5)			(6)
III. Doves and Pigeons:								
Mourning dove		30	Aug.					30
White-winged dove								
IV. Predaceous Birds:								
Golden eagle								
Duck hawk								
Horned owl								
Magpie								
Raven								
Crow								
II. Shorebirds, etc. Cont'd.								
California Gull		400	7/9		1	100	128	400
Ring-billed Gull		100	7/31					100
Forester's Tern		300	Aug.		1	60	75	300
Caspian Tern		200	July		1	50	60	200
Black Tern		150	7/31					150

Reported by David B. Marshall

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Stillwater W. M. Area Months of May to August , 194x51

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Valley Quail									50	Intermittent use of Area

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Stillwater W. M. Area Months of May thru August 1951

(1) VARIETY	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED USE		
				TRANS-FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Barley	383	0	383					383	293	90	0

(8) Indicate shipping or collection points

(9) Grain is stored at Headquarters Yard, Stillwater Wildlife Management Area

(10) Remarks

NR-8a REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)--55 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. Include only domestic grains; aquatic and other seeds will be listed on NR-9.

(3) Report all grain received during period from all sources, such as transfer, share-cropping, or harvest from food patches.

(4) A total of Columns 2 and 3.

(6) Column 4 less Column 5.

(7) This is a proposed breakdown by varieties of grain listed in Column 6.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters grainary", etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

ANAHO ISLAND NATIONAL WILDLIFE REFUGE

ANAHO ISLAND

Two trips were made to Anaho Island this period, the first on May 15 and the second on July 6. The purpose of the trips was for routine inspections and to observe this year's nesting.

I GENERAL

A. Weather Conditions

See Stillwater section of report.

B. Water Conditions

Our September-December, 1950, report discussed the unusually heavy inflow into Pyramid Lake in the fall of 1950. We have no additional information to add to the levels given in that report.

C. Fires

None.

II WILDLIFE

A. Migratory Birds

From two visits, we aren't qualified to determine peak populations and other data requested on MR forms. For this reason the MR forms include only what we saw. The table shows this year's nesting as compared to last year's. All colonies were at the same locations as last year except where otherwise noted.

COMPARISON OF NESTING DATA FOR 1950 AND 1951 ON ANAHO ISLAND

	Adults	Nests	Young	Dead Young In Nest	Colonies
White Pelican					
1950			4160		15
1951		5650	3742		11
Double-crested Cormorant					
1950		1028	1650	103	5
1951		1300		100	4
California Gull					
1950	2000		400		
1951	1800	1706	684		

Information by species, or groups, follows:

Grebes. One eared grebe was seen on the May 15 trip and up to 25 Western grebes were seen on both trips . Western grebes are a conspicuous part of the fauna of Pyramid Lake.

White Pelican. The number of white pelicans using the area this year was slightly below that of last. Around 15 nesting colonies were present in 1950 while this year the number was placed at 11. Unlike last year, no colonies were present on the summit of the island and the stage of nesting was not in all cases further advanced at successively higher elevations. On the May 15 trip nesting stages ran from nest building in some colonies to about one-fourth grown young in one colony. On July 7 hatching was not quite complete while the above-mentioned young were almost adult-like and quickly took to the water. This time we managed to get a nest count. Nests were counted in the eight most advanced colonies on May 15 and in the three others on July 7th. The number of nests indicates around 5,650 pairs, or a nesting population of 11,300. A comparison of the number of young produced this year as compared to last indicates last year's nesting population was around 12,500. The number of nests to a colony ran from 18 to 2,476. The count of young was made on July 7 a nd is comparable to last year's count made July 3.

Double-crested Cormorant. Because laying was in progress, the May 15 trip was too early for counting cormorant young and the July 7 trip was too late as almost all young had left their nests. The only comparable data we got was a nest count, which shows a sizeable increase, as shown in the table. Like the pelicans, a count of adults is practically impossible and the best method for determining the population appears to be a nest count. A large cormorant colony is also present on two of the pinnacles at the north end of Pyramid Lake.

Great Blue Heron. At least 16 nests were present in brush along the shore next to the cormorant colonies. The nesting extended over a lengthy period. Ten nests were found in 1950.

Canada Goose. Indications point toward sizeable production of honkers along the shores of Pyramid Lake, but off the island shore we saw but one Class I young. Around 125 adults were present in the water off the island on May 15 and some 50, or more, on July 7.

California Gull. Counts of young, nests and adults were made. A count of 1800 adults as compared to 1706 nests on May 15 indicates roughly half the nesting population was present at the colony at that particular time. On May 15 egg clutches appeared complete in most nests and by July 7 a few young could fly. The count of 684 live young and 100, or more, dead ones on July 7 shows once again high mortality.

Caspian Tern. Fifteen adults and four or five young were noted

in the gull colony.

Other Birds. Other birds seen on the island include two ravens, several turkey vultures, rock wrens, a canon wren and a Western meadowlark.

2. Food and Cover

No change except this year very few fish were noted in the pelican and cormorant colonies. Consequently, unlike last year, we were not able to get a good cross-section of the species of fish being taken. Of special note, however, was four Sacramento perch (Archoplites interruptus) found at one pelican nest. We did not note any perch last year. Other species found this year again were carp (Cyprinus carpio), chubs (Siphateles obesus) and cui-ui (Chasmistes cujus).

E. Predaceous Birds

None noted except the ravens. Considerable avian predation takes place, however, as California gulls seek every chance to prey on pelican eggs.

VI PUBLIC RELATIONS

B. Refuge Visitors

Accompanying the writer on the July 7 trip were Dr. Frank Richardson, Professor of Zoology, University of Nevada, Vincent Mowbray, bird bander from Reno and former University of California Zoology graduate and Ted Frantz, student of Dr. Richardson's. The assistance of these men was appreciated, as launching a boat into the Lake and getting it out is far from being a one-man job. Mowbray banded 150 young white pelicans, which was also appreciated, as it should add to our ever increasing knowledge of Anaho Island pelican movements.

As far as known, there were no other visitors.

WATERFOWL

REFUGE Ayahe Island MONTHS OF May to August, 1951

Data for two trips only - 5/15 and 7/7

(1) Species	(2) First Migrants Seen		(3) Peak Concentration		(4) Last Migrants Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
1. Swans:									
Whistling swan									
2. Geese:									
Canada goose	125	5/15			50	7/7	1	1	
Cackling goose									
Brant									
White-fronted goose									
Snow goose									
Blue goose									
3. Ducks:									
Mallard	5	5/15							
Black Duck									
Gadwall									
Baldpate									
Pintail									
Green-winged teal									
Blue-winged teal									
Cinnamon teal									
Shoveller									
Wood duck									
Redhead	2	5/15							
Ring-necked duck									
Canvas-back									
Scaup									
Golden-eye									
Buffle-head									
Ruddy duck									
American Merganser	2	5/15			15	7/7			
4. Coot:									

Form NR-1

3-1750
(June 1949)

(over)

SUMMARIES

Total Production:

Geese 1

Ducks 0

Coots 0

Total waterfowl usage during period Unknown

Peak waterfowl numbers Unknown

Areas used by concentrations Island shores

Principal nesting areas this season Unknown

Reported by David B. Marshall

INSTRUCTIONS

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance.

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.

(5) Young Produced: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

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61355

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Anaho Island Months of May to August 194x 51

Refuge visited 5/15 and 7/7 only

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	1	5/15			1	5/15				
Western Grebe	2	5/15			25	7/7				
White Pelican							11	5,650	3,742	15,000
Double-crested Cormorant							4	1,300	2,000	5,000
Great Blue Heron							1	16	30	66
II. Shorebirds, Gulls and Terns:										
California Gull							1	1,706	600	4,000
Caspian Tern							1	10	4	25

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven			2	7/7	
Crow					

Reported by David B. Marshall

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

Composition credit for this report is as follows:

LeRoy W. Giles - Sections, IA, IB, IIIA, IIIB, IIIC, IIID, VB, VID, VIE, VIF;
David B. Marshall - Sections, IIA, IIB, IIC, IID, IIE, IIF, IVA, VA

Illa E. Cress - Sections, IVE, VIB, VIC

Photos:

Marshall took all the photos in this narrative with the exception of the two, R-28 and R-29, which were taken by Thomas C. Horn.

The following NR forms are not applicable to the Area through this report period:

NR 3 - Big Game
4 - Small Mammals
5 - Disease
6 - Fish
7 - Plantings
8 - Cultivating Crops
9 - Collections and Receipts
10 - Haying and Grazing
11 - Timber Removal

Submitted September 28, 1951

LeRoy W. Giles

LeRoy W. Giles
Refuge Manager, Acting

APPROVED:

_____

_____

COVER PICTURE

M-219. Harvesting Alkali Bulrush Seed. 8/31/51

M-217. New Refuge Office. A highlight of the period was our move into this building on South Maine Street in Fallon. 8/22/51

T-6: Elevating grader at work on Pintail Bay Extension Dike. 8/31/51

T-7. [redacted] and carryall bringing a low portion of the Pintail Bay Dike up to grade. 8/31/51

M-213. If the ditch banks in the East WF Plot continue to wash at the present rate, they will turn from truck trails to foot trails. This occurs despite the most careful regulation of water. 8/21/51

M-218. Combine as brought from Tule Lake Refuge before unloading at Stillwater for harvesting Scirpus paludosus seed. 8/23/51

M-220 and M-221. These two photos show the water flowing out onto the alkali flat at A Dike. This is to be a new marsh pond. 8/31/51

M-216. Scirpus paludosus seeding on proposed pond's shoreline at A Dike. Levels were run; seed broadcast from pickup which pulled drag to cover seed. Flat was flooded during latter part of period. 8/21/51

M-215. Alkali flat at A Dike which will soon become a part of the marsh due to seeding operations in previous picture. 8/21/51

M-201. One of the HD-14's after having broken through the top crust near Structure No. 2. 8/17/51

M-203. Lorain dragline pulling out the H D - 14. 8/17/51

B-214. Lima dragline at work on Lead Lake-Shutgrass Drain. 8/21/51

B-200. Lorain dragline with bucket raised after just having filled Reo with fill for Dike at Structure No. 2. 8/17/51

R-29. Paiute Waterfowl Food Plot lateral check under construction. The cut for the drop at this structure is evident in the photo. 6/22/51

R-202. "The ole swimming hole." Excavation for Structure No. 2 before pumping out. Pump being moved into place. 8/17/51

M-196. A section of Millen's Channel showing high cattail growth. These cattails are growing in two feet of water and extend 15 feet above the surface. Cattail species most fully meets description of Typha dominguensis. 7/9/51

N-194. Nest and eggs of the Snowy Plover. No known published nesting records exist for this species in Nevada. This nest was 3 ft. from a road and 420 ft. from water at the NE corner of the Nutgrass Unit. 6/20/51

R-28. Nevada Fish and Game Commission tour over area at No. 5 Structure. W. Monroe, W. Kirch, P. Doyle, B. Quilici, F. Groves, SFG; Cantrell FWS; J. Etchart, F. Wright, J. Hazard, T. McCulloch and D. Evans of SFG. 6/22/51

M-206. An alkali weed flat. Low areas surrounding the Stillwater Marsh which receive water in winter when marsh levels are extra high come up with alkali weed in late spring when the water goes off. The plant is preferred to all others in the marsh as a livestock food. 8/20/51

M-207. Water in the marsh was so high this year that some alkali weed areas such as this one remained under water. Last year's growth can be seen throughout this pond. Those alkali weed flats which remained under water supported a greater number of nesting pairs than any other type. Migrant ducks also prefer these areas when flooded. 8/20/51

M-205. A periodically flooded pond in the saltgrass zone. Our waterfowl pass by permanent marsh to rest, feed and establish nesting territories at "puddles" such as this which receive water only when marsh is high. 8/20/51

M-206. A view across a section of the large seep lake in the Indian Lakes. This 32 acre lake was again a heavy producer. Around 350 young ducks were brought off it. State operated banding trap in foreground with a good catch of pintails. 8/20/51

M-209. This check in the East Waterfowl Food Plot was planted to barley and sweet clover. The stand is scanty but before a good growth can be realized this ground will have to be levelled. Sea-blite, a weed, is more apparent than the barley and sweet clover. 8/21/51

M-210. Sweet clover - barley mixture has done exceptionally well here where ground is relatively level. This was taken in the East WF Plot where seeding took place for the first time this spring. 8/21/51

M-211. This contour in the East WF Plot was planted to rye. Considering the roughness of the ground, and the fact that this represents the first planting, the rye, too, has made a good stand. Desert land here cannot be transformed to cropland overnight. 8/21/51

M-212. Cattail coming up in barrow in East WF Plot. Our chances of turning the barrow pits into something waterfowl can use look dim considering the fact water was first put into this ditch only last spring. Despite periodic drying through the summer these seedlings are doing well. It's discouraging. 8/21/51